

Health Check and Immunization Compliance: A Medical Record Study Among North Carolina Medicaid Children 6 through 24 Months of Age

**A Report Presented to the
Division of Medical Assistance**

October 3, 2002

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Introduction

North Carolina currently has three managed care delivery systems for Medicaid recipients: 1) Carolina ACCESS, a primary care case management (PCCM) program; 2) Carolina ACCESS II/III, an enhanced PCCM program focusing on case management for high risk populations; and 3) Health Care Connection, a Health Maintenance Organization (HMO) program located in Mecklenburg County only. Approximately 70% of Medicaid recipients are enrolled in one of these programs.

The goals of the Health Check/Immunization Medical Record Review study were to:

- Evaluate and compare compliance across managed care delivery systems with state and federally mandated regulations regarding Health Check screening components including immunizations for NC Medicaid children ages 6 months to 2 years of age;
- Evaluate and compare compliance with the American Academy of Pediatrics Recommended Childhood Immunization Schedule across the managed care delivery systems.
- Evaluate compliance with medical record documentation for Health Checks and Immunizations across managed care delivery systems.

Methods

In the first phase of the project, the State Center for Health Statistics used Medicaid administrative data to draw a random sample of Medicaid-eligible children across systems of care. Only those children between the ages of 6 and 24 months of age as of March 31, 2000 were selected. The sample was generated from four Medicaid data sets.

First, all eligibility information was retrieved for all children between the ages of 6 and 24 months of age as of March 31, 2000. Only children with enrollment dates between October 1, 1999 and March 31, 2000 and who had a record of continuous enrollment during these 6 months were retained. The eligibility data set, produced in this step, contained 65,330 children.

Second, a system of care file was created. All children enrolled in Carolina ACCESS, ACCESS II and III, and an HMO were selected from the claims database. Only those claims with service dates between October 1, 1999 and March 31, 2000 were selected. Children were retained in the sample only if they were continuously enrolled in one system of care for the 6 months.

Third, all Health Check claims were selected for children 6-24 months of age as of March 31, 2000. These well child visits were selected as specified in the HEDIS 2000¹ requirements.

Fourth, to determine if a child had at least one Health Check visit, within a system of care, records from the system of care data set were matched with the Health Check data

set. Only children having at least one Health Check visit during the 6-month time period October 1999 through March 2000 were retained. For those children with at least one Health Check visit, their record was matched to the eligibility set (generated in step 1) to obtain demographic information for each child. This process produced records for 17,624 children in Carolina ACCESS, 11,949 children in ACCESS II and III, and 612 children enrolled in an HMO.

A sample for each system of care was selected using HEDIS criteria for determining sample size: an alpha level set at 5 percent, 80 percent power, 2-tailed test of significance, with a worst-case assumption of a 50 percent expected value assumed.² The sample sizes, with a 20 percent over-sample, were 451 for Carolina ACCESS, 448 for ACCESS II and III, and 281 for HMOs. The three HMO entities in Mecklenburg County are SouthCare, United, and Wellness. Lastly, to facilitate ease of chart review, ten North Carolina counties were randomly selected for each system of care. For example, the 451 Carolina ACCESS records were divided among 10 counties: Cumberland (208), Iredell (63), Halifax (58), Pasquotank (54), Durham (21), Yadkin (15), Davidson (12), Moore (9), Montgomery (6), and Wilson (5).

In the second phase, the samples for each system of care were used by Medical Review of North Carolina, Inc. to obtain medical chart information for each of the individuals. A complete immunization history for each child was constructed using information obtained from the medical record. If a child's immunization record was incomplete, immunization records were obtained from previous providers. A data set based on the chart reviews was created for statistical analysis by the State Center for Health Statistics.

Medical Record Review

A medical record audit was conducted by Medical Review of North Carolina, Inc. to evaluate compliance with the North Carolina Medicaid Managed Care HMO Contract for medical record standards. Table 1 shows the numbers and percentages of specific medical components that were present.

Overall Rates: Results of the audit show that 59% of the medical records had a problem list, 82% had record information for allergies, 43% had a medical history, 88% had all entries dated, 84% had all entries identified by author, 56% had each page identified, 59% had a completed immunization record. Components varied widely by system of care. Results by System of Care are also presented in Table 1.

¹ Refer to HEDIS 2000 Technical Specifications, p. 38.

Table 1. Number and Percent of Medical Record Components By Systems Of Care (N=1,177) (Children Ages 6 - 24 months)				
Medical Record Components	Access 1 (n=448)	Access23 (n=448)	HMO Total * (n=281)	Total All Systems of Care
Problem List	321 (72%)	264 (59%)	112 (40%)	697 (59%)
Allergies	381 (85%)	354 (79%)	231 (82%)	966 (82%)
History	228 (51%)	215 (48%)	61 (22%)	504 (43%)
All Entries Dated	366 (82%)	431 (96%)	235 (84%)	1032 (88%)
All Entries Identified by Author	351 (78%)	407 (91%)	230 (82%)	988 (84%)
Each Page Contains Identification	303 (68%)	292 (65%)	62 (22%)	657 (56%)
Completed Immunization Record	294 (66%)	311 (69%)	90 (32%)	695 (59%)
* HMO Total is the sum of SouthCare, United, and Wellness systems of care.				

Health Check Services

Table 2 presents specific Health Check screening component rates. Eighty-seven percent of the children ages 6-24 months received a comprehensive unclothed medical exam; 60% had a comprehensive health history; 89% had a height, weight, and length on a growth chart; 82% had an assessment of nutritional intake habits or frequent volume of food; 73% had counseling /education related to child development; 70% had counseling / education related to health lifestyles, practice; 66% had counseling / education related to accident and disease prevention; 92% had a head circumference measurement; 68% had an assessment for eye, hand coordination; 78% an assessment for gross motor function; 70% had an assessment for fine motor skills; 69% had an assessment for self-help skill; 76% had an assessment for speech; 62% had assessment for behavioral development; 55% had an assessment for mental retardation; 17% had a written developmental assessment; 14% had a vision assessment I; 5% had vision assessment II; 71% had a hearing assessment I; 31% had a hearing assessment II; 59% had hemoglobin or hematocrit procedures; 58% were tested for sickle cell; 31% had one lead screening; and 1% had a second lead screening. Results for specific systems of care are also presented in Table 2.

Table 2. Number and Percent of Health Check Components By Systems Of Care (N = 1,177) (Children Ages 6 - 24 Months)				
Health Check Components	Access 1 (n=448)	Access23 (n=448)	HMO Total * (n=281)	All Systems of Care
Comprehensive unclothed physical exam	87%	84%	93%	87%
Comprehensice medical history	66%	74%	28%	60%
HT, WT, and Length on growth chart	89%	90%	86%	89%
Nutritional intake, habits or freq/vol of food	79%	84%	84%	82%
Counsel/educ - child development	75%	72%	70%	73%
Counsel/educ - healthy lifestyles, practice	69%	73%	67%	70%
Counsel/educ - accident, disease prevention	66%	64%	70%	66%
Measure - head circumference	88%	94%	93%	92%
Assess - eye hand coordination	64%	67%	77%	68%
Assess - gross motor function	80%	74%	80%	78%
Assess - fine motor skill	66%	69%	77%	70%
Assess - self-help skill	72%	69%	67%	69%
Assess - speech development	78%	75%	72%	76%
Assess - behavioral development	67%	63%	52%	62%
Assess - mental development	57%	55%	52%	55%
Written developmental assessments	23%	17%	6%	17%
Vision assessment 1	15%	18%	8%	14%
Vision assessment 2	5%	7%	1%	5%
Hearing assessment 1	75%	65%	74%	71%
Hearing assessment 2	35%	27%	33%	31%
Hemoglobin/Hematocrit	57%	69%	48%	59%
Sickle Cell	63%	56%	52%	58%
Lead Screening 1	38%	33%	19%	31%
Lead Screening 2	1%	2%	1%	1%
* HMO Total is the sum of SouthCare, United, and Wellness systems of care.				

Immunization Compliance

A child was counted as compliant with immunization requirements only if he/she had received all immunizations required for his/her age group. Each child 6 to 17 months of age was required to have a record of two doses of hepatitis B (Hep B) vaccine, three doses of diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccine, two doses of Haemophilus influenzae type B (HiB) vaccine if Pedvax or Combvax was used or three doses for any other HiB vaccine type, and two doses of inactivated polio (IPV) vaccine. A child 18 to 24 months of age was required to have a record of three doses of Hep B vaccine, four doses of DTaP vaccine, three or four doses of HiB vaccine (three for Pedvax or Combvax or four for any other HiB vaccine type), three doses of IPV vaccine,

one dose of Measles, Mumps, and rubella (MMR) vaccine, and one dose of Varicella vaccine.

Overall Immunization Rates: Findings showed that 40 percent of the 6-17 month-old children had received all of the age-appropriate immunizations and 42 percent of the 18-24 month olds had received all of the age-appropriate immunizations.

Immunization Compliance by System of Care: Table 3 presents compliance rates by system of care for each age group. For the 6-17 month group, Carolina ACCESS I had the highest compliance rate (46%), followed by HMO (39%), and ACCESS II/III (36%). For the 18-24 month group, HMO had the highest rate (48%), followed by Carolina ACCESS I (43%), and ACCESS II/III (39%).

Table 3. Number and Percentage of Children Who Had All The Required Immunizations By Systems Of Care (N=1177)				
(Children ages 6 - 17 months: n = 908) ; (Children ages 18 - 24 months: n = 269)				
Age Groups	Access 1 (n1=340; n2=108)	Access23 (n1=337; n2=111)	HMO Total * (n1=231; n2=50)	All Systems of Care (n1=908; n2=269)
6 - 17 Months	155 (46%)	122 (36%)	90 (39%)	367 (40%)
18 - 24 Months	46 (43%)	43 (39%)	24 (48%)	113 (42%)
n1 = Total number of children ages 6 - 17 months. n2 = Total number of children ages 18 - 24 months.				
Age Group 6 - 17 Months: Children who have had all of the following required immunizations: (HEP1 and HEP2 and DTap1 and DTap2 and DTaP3 and HIB1 and HIB2 and HIB3 AND POLIO1 and POLIO2). Age Group 18 - 24 Months: Children who have had all of the following required immunizations: (HEP1 and HEP2 and HEP3 and DTap1 and DTap2 and DTaP3 and DTaP4 and HIB1 and HIB2 and HIB3 and HIB4 and POLIO1 and POLIO2 and POLIO3 and 1 MMR and 1 Varicella).				
* HMO Total is the sum of SouthCare, United, and Wellness systems of care.				

Specific Immunization Compliance: Compliance rates are dependent upon having all of the required immunizations. Therefore, specific immunization rates were examined to identify immunizations that influence the overall compliance rates. Table 4 shows that for children ages 6-17 months, only 30 percent had received a 3rd HiB immunization. For children ages 18-24 months, only 32 percent had received their 4th HiB shot. To examine the effect of HiB on the compliance rate, HiB was removed from the calculations of the compliance rates. Upon removing HiB, the overall compliance rate for children ages 6-17 months increased from 37 percent to 70 percent. The compliance rate for the 18-24 months increased from 31 percent to 70 percent.

Table 4. Immunization By Age Groups (Percentage of Children Who Had Specific Immunizations)						
Immunizations	All (N = 1,177)		6-17 months (n=908)		18-24 months (n=269)	
	Number	Percent	Number	Percent	Number	Percent
HEP1	1,122	95%	858	94%	264	98%
HEP2	947	80%	685	75%	262	97%
HEP3	711	60%	461	51%	250	93%
DTAP1	1,167	99%	899	99%	268	100%
DTAP2	1,145	97%	879	97%	266	99%
DTAP3	1,050	89%	786	87%	264	98%
DTAP4	307	26%	71	8%	236	88%
HIB1	1,164	99%	896	99%	268	100%
HIB2	1,133	96%	869	96%	264	98%
HIB3	533	45%	274	30%	259	96%
HIB4	130	11%	41	5%	89	33%
POLIO1	1,168	99%	900	99%	268	100%
POLIO2	1,137	97%	872	96%	265	99%
POLIO3	521	44%	271	30%	250	93%
MMR	537	46%	274	30%	263	98%
VARICELLA	441	37%	216	24%	225	84%

Note: Required immunizations for each age group are shaded.

Vaccines by Mean Age: Table 5 shows the mean age (in months), at which children received immunizations. For the 6-17 month age group, HMO's had the lowest grand mean age of immunization (3.70), followed by Carolina ACCESS (3.90), and ACCESS II and III (4.02). The overall mean for the 6-17 age group was 3.85 months. For the 18-24 age group, Carolina ACCESS had the lowest grand mean age of immunization (7.20), followed by ACCESS II and III (7.36), and HMO's (7.60). The overall mean for the 18-24 month age group was 7.34.

Table 5. Average Age In Months At Time Of Immunization By Systems Of Care And Age Groups (in months)								
IMMUNIZATIONS	Access I		Access23		HMO Total *		All Systems of Care	
	6 - 17 Months	18 - 24 Months	6 - 17 Months	18 - 24 Months	6 - 17 Months	18 - 24 Months	6 - 17 Months	18 - 24 Months
HEP1	1.3	0.2	1.3	0.1	1.28	0.73	1.3	0.3
HEP2	2.4	1.8	2.4	1.6	3.04	2.23	2.6	1.8
HEP3	7.6	7.7	7.5	7.9	7.08	7.66	7.4	7.8
DTAP1	2.0	2.2	2.0	2.1	1.93	2.78	2.0	2.3
DTAP2	4.2	4.4	4.3	4.4	4.2	4.35	4.3	4.4
DTAP3	6.3	6.8	6.5	7.1	6.24	6.85	6.4	6.9
DTAP4	14.6	15.9	14.3	15.8	15.1	16.59	14.5	16.0
HIB1	2.1	2.3	2.0	2.0	1.99	2.9	2.0	2.3
HIB2	4.3	4.4	4.3	4.4	4.24	4.4	4.3	4.4
HIB3	9.9	11.2	11.1	12.1	7.71	9.77	9.5	11.3
HIB4	13.2	14.0	14.0	15.2	13	15	13.2	14.7
POLIO1	2.0	2.2	2.0	2.1	1.99	2.7	2.0	2.3
POLIO2	4.3	4.5	4.3	4.4	4.24	4.73	4.3	4.5
POLIO3	9.9	12.1	10.9	13.2	9.27	14.12	10.1	12.9
MMR	12.1	12.6	12.3	12.6	12.16	13.13	12.2	12.7
VARICELLA	12.4	12.9	12.3	12.9	11.98	13.12	12.3	12.9
Summary Average	3.90	7.20	4.02	7.36	3.70	7.60	3.85	7.34
Note: In the last 2 columns, the required immunizations for each age group are shaded.								
* HMO Total is the sum of SouthCare, United, and Wellness systems of care.								

Discussion

Although the overall and system of care immunization compliance rates were found to be much lower than what one might expect to see, inspection of individual immunization rates by age group pointed to the main source of the low compliance for each group. Findings suggest that the compliance rate for the 6-17 month group was greatly reduced by the requirement of the 3rd HIB vaccine. The overall compliance rate for the 18-24 group was reduced by the requirement of the fourth HIB vaccine.

It should be noted that some of the compliance rates and means presented in this report are based on very small numbers of cases, especially those for the specific HMOs. Therefore, small differences in rates or means may not be statistically meaningful.